

Supporting Information:

**Organo-Modified Hydrotalcite-Quantum Dots Nanocomposites as
Novel Chemiluminescence Resonance Energy Transfer Probe**

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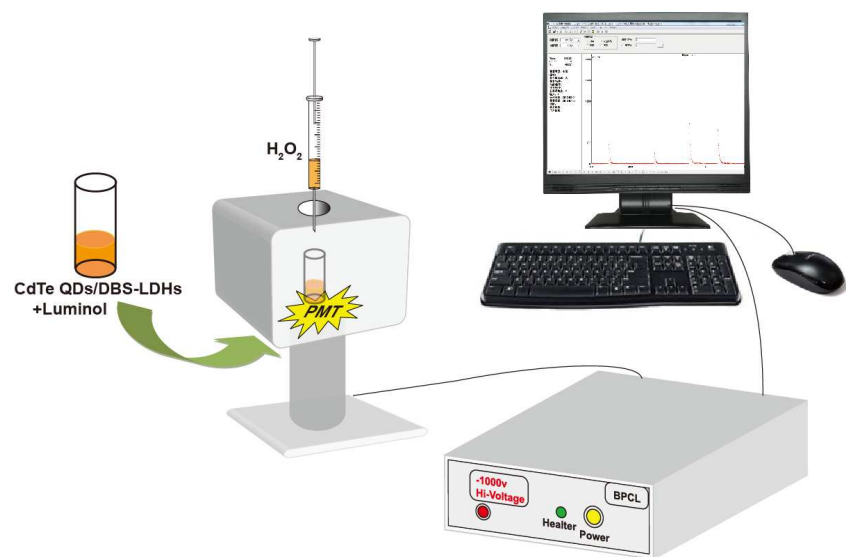


Figure S1. Schematic diagram of a static CL setup.

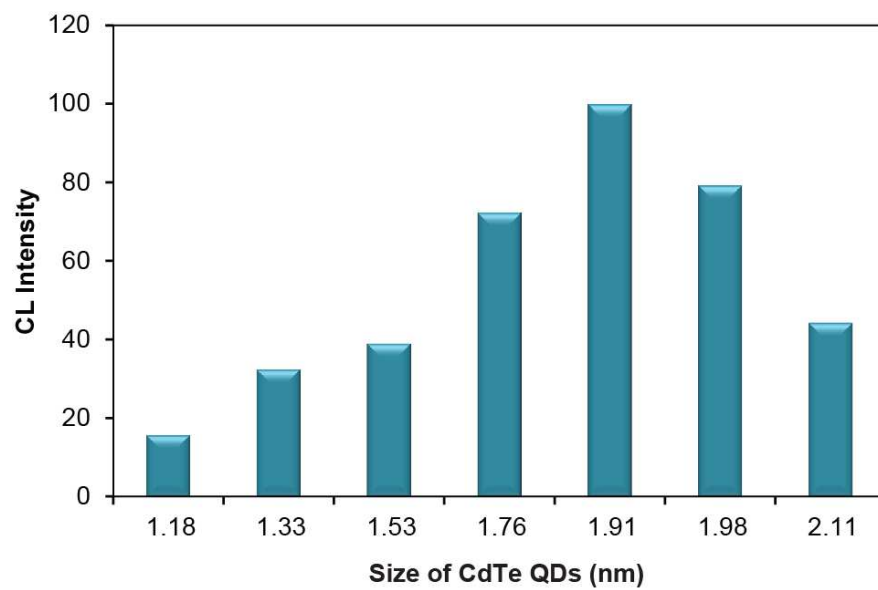


Figure S2. Effect of the size of 0.1 mM CdTe QDs embedded into the DBS-LDH surface on the relative CL intensity.

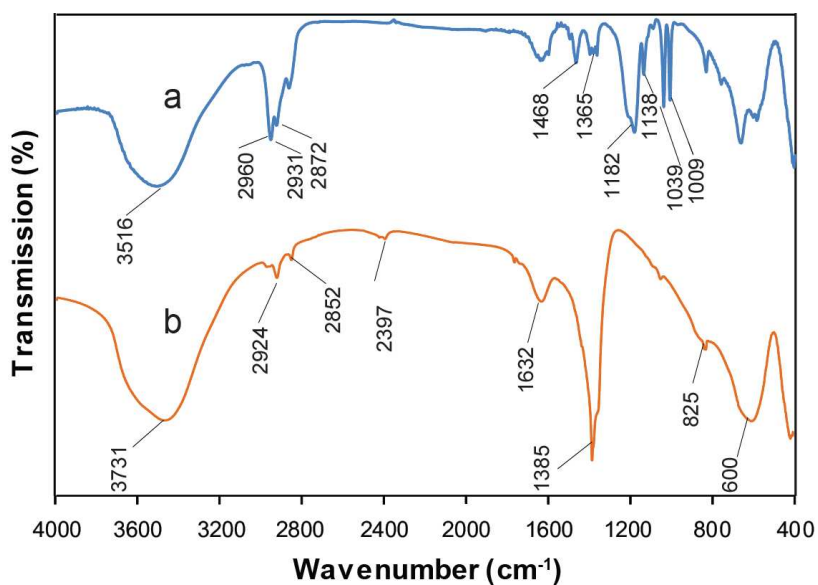


Figure S3. FT-IR spectra of (a) Mg-Al- NO₃ LDHs, and (b) Mg-Al-DBS LDHs.

The intercalation of SDBS molecules in the LDH interlayer was confirmed by FTIR spectra (**Figure S3**). The presence of DBS ions was evidenced by C-H bending vibration band at 1468 cm⁻¹, and C-H stretching vibration bands at 2960, 2931 and 2872 cm⁻¹. The antisymmetric and symmetric stretching vibration of S=O appears at 1182 and 1039 cm⁻¹. The aromatic C-H band appears at 1138 and 1009 cm⁻¹.

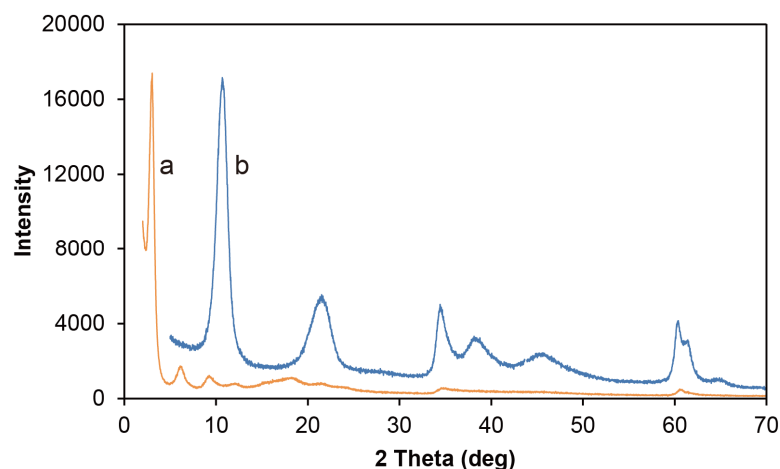


Figure S4. Powder XRD patterns of (a) Mg-Al-NO₃ LDHs, and (b) Mg-Al-DBS LDHs.

Representative XRD patterns of NO₃-LDHs and DBS-LDHs were shown in [Figure S4](#), indicating all the synthesized DBS-LDHs have typical, well-order layered structures with a high degree of crystallinity. Compared with the XRD patterns for NO₃-LDHs, a new series of peaks is clearly shown at lower diffraction angles ($2\theta = 3.03^\circ$) with $d_{(003)}$ value of 29.11 Å. The expanded basal spacing, compared with that of NO₃-LDHs (8.22 Å), suggested that the anionic surfactants have been intercalated into LDH interlayer spaces. The basal spacing of LDHs is the sum of the interlayer height and the thickness of a Mg/Al-hydroxide sheet (about 4.8 Å). In this case, the basal spacing of 29.11 Å is larger than the sum of the thickness of a Mg/Al-hydroxide sheet (ca. 4.8 Å) and the length of the alkyl chain of DBS⁻ anion (ca. 21.40 Å), indicating that the intercalated surfactants adopt a paraffin bilayer arrangement model.

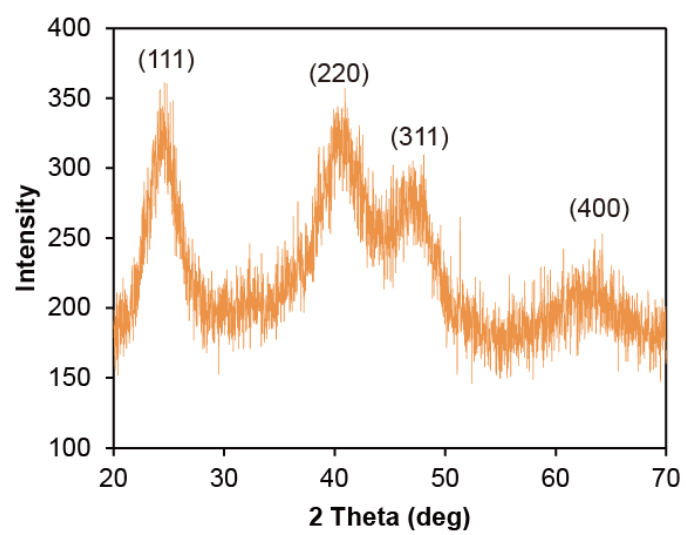


Figure S5. XRD pattern of TGA-stabilized CdTe QDs.

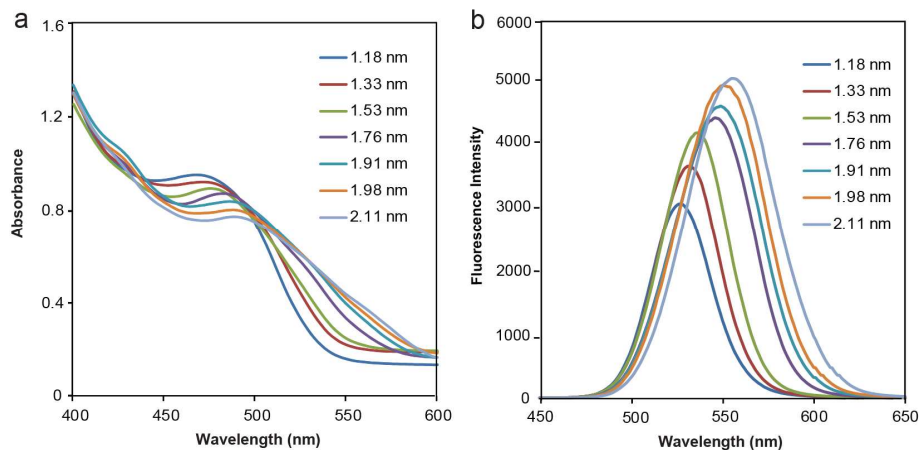


Figure S6. Characterization of the as-prepared TGA-capped CdTe QDs with different sizes. (a) Absorption spectra; (b) Fluorescence spectra (The excitation wavelength is 390 nm)

According to the reported calculation method, the particle sizes of the as-prepared CdTe QDs were established by means of the following expression: $D = (9.8127 \times 10^{-7})\lambda^3 - (1.7147 \times 10^{-3})\lambda^2 + (1.0064)\lambda - 194.84$, where D (nm) was the size of CdTe QDs, and λ (nm) was the wavelength of the absorption peak of CdTe QDs. The results showed that the particle diameters of the as-prepared CdTe QDs increased from 1.18 to 2.11 nm, corresponding to the absorption peaks from 468 to 492 nm (**Figure S6a**) and the fluorescence emission peaks from 527 to 556 nm (**Figure S6b**). Note that the absorption peaks and the fluorescence emission peaks shifted to the longer wavelengths with increasing CdTe QDs sizes as a consequence of quantum confinement.

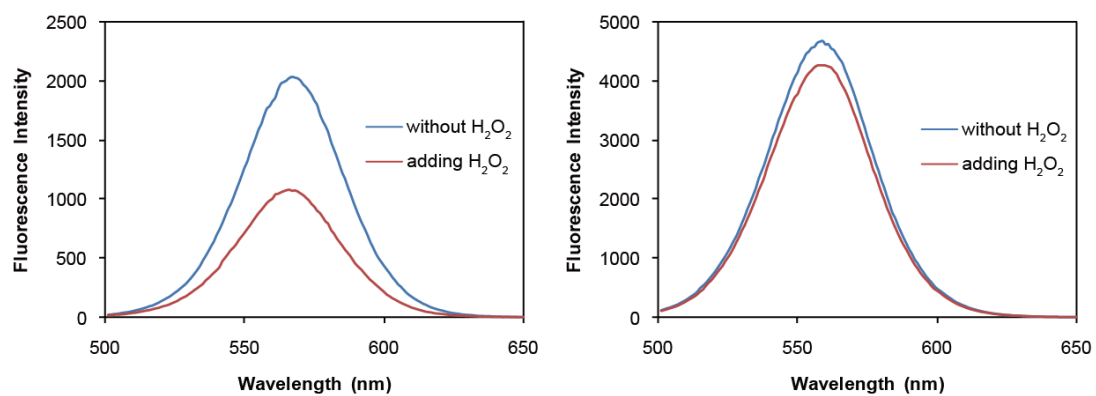


Figure S7. Photoluminescence of 0.1 mM CdTe QDs assembled on the surface of the NO₃-LDHs (left) or DBS-LDHs (right) before and after their interaction with 0.1 mM H₂O₂.

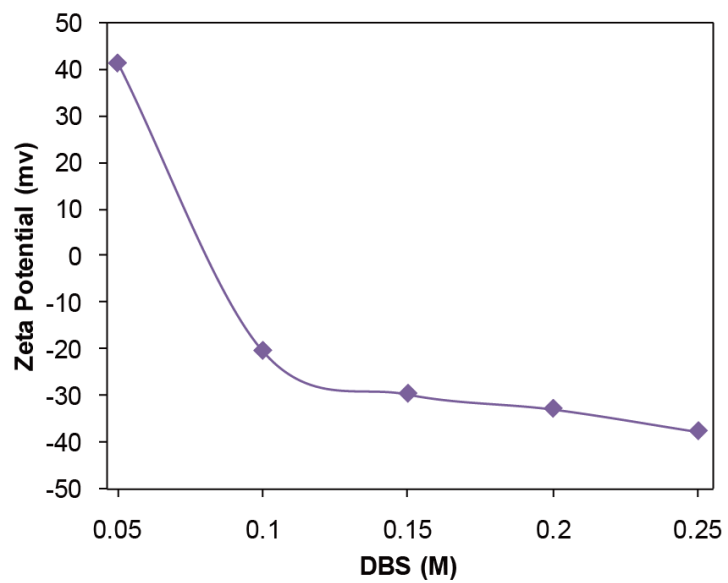


Figure S8. Plots of the zeta potential of DBS-LDHs with different loading amounts of DBS anions.

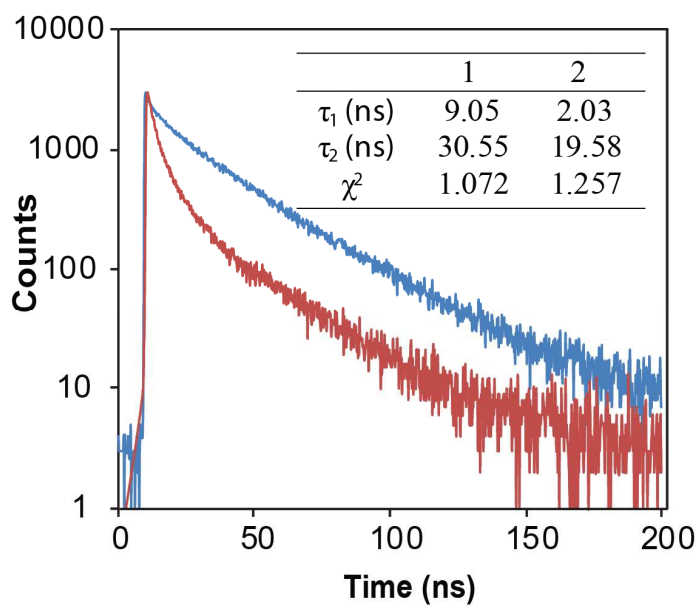


Figure S9. Fluorescence decay profile for 0.1 mM CdTe QDs and 0.1 mM CdTe QDs embedded into the surface of DBS-LDHs (from top to bottom). Inset: Fluorescence lifetimes of the (1) CdTe QDs and (2) CdTe QDs embedded into the surface of DBS-LDHs with bi-exponential fitting. τ_1 : the fluorescence lifetime of excitonic state; τ_2 : the fluorescence lifetime of trap state; χ^2 : the fitting goodness.



Figure S10. Fluorescence micrographs excited at 380 nm (a) 1.0 mM CdTe QDs; (b) DBS-LDHs; (c) 1.0 mM CdTe QDs embedded into the surface of DBS-LDHs.

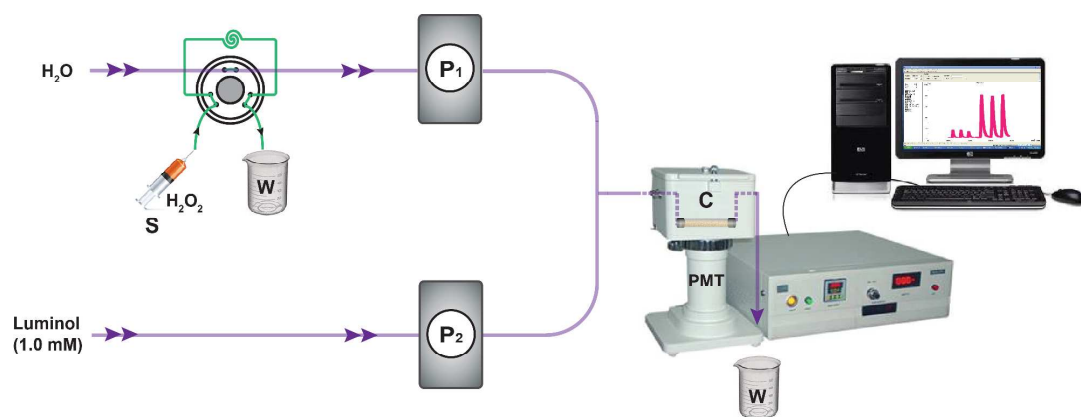


Figure S11. Schematic diagram of the CL flow-through device. S, samples; C, column; W, waste; P, peristaltic pumps; PMT, photomultiplier tube.

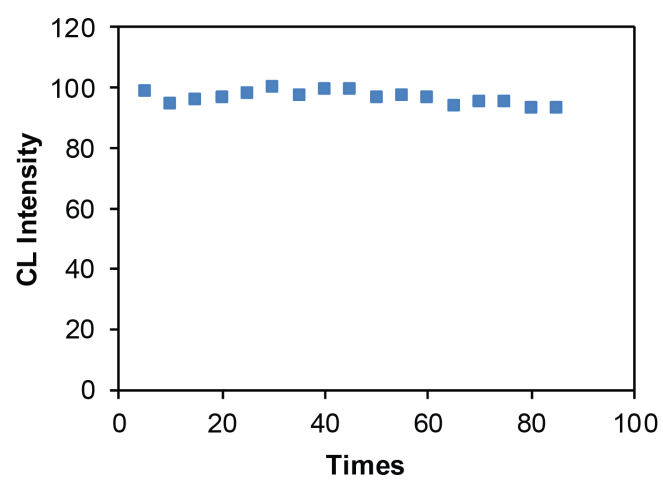


Figure S12. CL intensity for the repeated injections of 10.0 μM H_2O_2 .

Table S1. Tolerance limit of various coexistent substances on 5.0 μM H_2O_2 under the optimum conditions

Tolerances (M)	Coexistent substances
10^{-2}	Na^+ , Zn^{2+} , Cl^- , SO_4^{2-}
2×10^{-3}	H_2PO_4^- , HPO_4^{2-}
10^{-3}	Mg^{2+} , Al^{3+} , NO_3^-
5×10^{-4}	PO_4^{3-}
10^{-4}	Ca^{2+}
10^{-5}	Fe^{2+} , Cu^{2+}